

FEATURES



Scientists and technicians work on computers at the European Organization for Nuclear Research's Large Hadron Collider Computing Grid room in Geneva. The Worldwide LHC Computing Grid combines the power of more than 140 computer centers in 33 countries that process more than 15 million Gigabytes of data every year produced from the hundreds of millions of subatomic collisions expected inside the Large Hadron Collider every second.

PHOTOS: AFP AND EPA

[HEALTH]

Scabies, it's enough to make your skin crawl

Affecting more than 300 million people worldwide each year, scabies, an infestation of tiny mites, is frequently misdiagnosed

BY JANE E. BRODY
NY TIMES NEWS SERVICE, NEW YORK

Most people expect to return from vacation with fond memories of a relaxing or exciting time and perhaps photos to document it. That wasn't exactly the case for one 25-year-old man who took a trip to a Brazilian beach. Five weeks after returning to his home in Spain, he began to itch. He itched everywhere, intensely, and especially at night, which made sleep almost impossible.

After two months of this torment, with pimples and the sores from scratching them on his abdomen, buttocks and genitals, he sought help from a dermatologist. The diagnosis was scabies, an infestation of tiny mites he had most likely contracted from a sexual encounter during his vacation.

In describing this case in the July issue of *The Cleveland Clinic Journal of Medicine*, Sergio Vano-Galvan and Paula Moreno-Martin of Madrid called medical attention to a worldwide public health problem that each year affects more than 300 million people.

Scabies is frequently misdiagnosed and mistreated, partly because most physicians are unfamiliar with it and partly because its symptoms mimic so many other skin diseases.

A correct diagnosis is further complicated by the fact that symptoms can often appear six to eight weeks after a person becomes infested with the microscopic arthropod, making it seem as if the problem came from nowhere. But unlike other skin diseases, scabies is usually accompanied by a tell-tale sign: one or more burrows in the skin where female mites lay their eggs.

Scabies is easily cured, but only if patients and their close contacts conscientiously follow directions for medical treatment and environmental cleanup. However, even after a person is rid of the mites and their eggs, itching can persist for up to four weeks.

THE CULPRIT

The scabies mite, *Sarcoptes scabiei*, can afflict a number of animals. In dogs and sheep, the infestation is commonly called mange. Each species of animal has a specific variant of the mite, which cannot reproduce in other hosts. If your dog gets mange, as mine once did, you may be itchy for a while if the mites get into your skin, but the condition will cure itself when the adult mites die.

It's not so easy if you acquire the human scabies mite. At 0.4mm in length, the mite is barely visible to the naked eye. But just 10 adult females breeding in a person's skin are enough to cause bodywide torment, as they defecate and lay eggs that then hatch into larvae and develop into more adult mites. The itching is due to an allergic reaction to the mite, its excrement and burrows, though an antihistamine alone is rarely enough to quell the desire to scratch.

Scratching, however, can cause sores that become infected with bacteria like *Staphylococcus* or *Streptococcus*, prompting a diagnosis of impetigo and perhaps missing the underlying cause.

Scabies spreads most often through direct, prolonged skin-to-skin contact, like that between sexual partners and members of a household. As the Centers for Disease Control and Prevention put it in a fact sheet on scabies, "A quick handshake or hug will usually not spread infestation." But the mite can also be acquired from contaminated bedding, clothing or towels recently used by a person with scabies. Although an adult female mite can live on a person for up to a month, the mite rarely survives more than three days apart from a living body.

According to the American Academy of Dermatology, scabies has become a common problem among elderly people living in nursing homes and extended care facilities, where it can spread easily to attendants who in turn spread it to other residents. In the elderly, scabies is often mistaken for senile pruritus, itching caused by degenerative changes in aging skin.

Although taking a shower or bath soon after contact with live mites can wash them away, an attack of scabies is not a symptom of poor hygiene. Literally anyone can get it, regardless of age, sex or social class. The mites can neither fly nor jump but rather crawl at a rate of 2.5cm a minute on warm skin, Olivier Chosidow of the Université Pierre et Marie Curie in Paris reported in *The New England Journal of Medicine* in April 2006.



ILLUSTRATION: NY TIMES NEWS SERVICE

THE DIAGNOSIS

In the *Cleveland Clinic* journal article, the Spanish dermatologists wrote that every patient with intense itching should be suspected of having scabies, especially if a family member reports similar symptoms.

When a doctor is familiar with scabies, as most dermatologists should be, the diagnosis is relatively simple. The scabies mite has favored sites in which it lives, generally areas on the body that are warm or where clothing is tight: between fingers and under nails; in the folds of the wrist, elbow and knee; on the buttocks; around the belt line and nipples; and on the penis.

When children get scabies, the lesions tend to appear bodywide, including the scalp, palms and soles. A particularly severe, highly contagious form called crusted, or Norwegian, scabies can affect the elderly, AIDS patients and people on immunosuppressants. While people with ordinary scabies usually have no more than five to 15 live female mites on their bodies, those with crusted scabies can harbor hundreds, even millions, of adult mites.

To confirm the diagnosis, the doctor may take a scraping of a lesion and examine it under a microscope to look for the mite, its eggs or fecal matter.

TREATMENTS

The usual treatment is to apply a 5 percent permethrin cream to cool, dry skin from the neck to the bottom of the feet. The cream must be applied everywhere, including the groin, palms and soles and between fingers and toes. The medication, an insecticide, should be left on for eight to 14 hours, with a possible second application a week or two later in case some eggs survived and had hatched.

Permethrin, a synthetic form of pyrethrin, a natural insect-killing plant chemical, is considered safe for infants and pregnant women, though a 10 percent sulfur ointment and crotamiton cream may be used for infants. To treat the crusted form, an oral medication, ivermectin, is usually prescribed, with a second dose given two weeks later.

In addition to mite-killing medicine, antihistamines and calamine lotion are commonly used to relieve the itching.

To ensure successful eradication of the mites, all members of the household, close friends and sexual contacts must be treated simultaneously. In institutional settings like nursing homes or day care centers, all residents and workers must be treated at the same time. All bedding, towels and clothing used by those infested or potentially infested within three days before treatment must be washed in hot water and dried on high heat or dry-cleaned.

Conscious computers?

On Sunday, six computer programs will answer questions posed by humans in a bid to become the first recognized 'thinking' machine — an experiment that could raise profound questions about artificial intelligence

DAVID SMITH
THE GUARDIAN, LONDON

Can machines think? That was the question posed by the great mathematician Alan Turing. Half a century later six computers are about to converse with human interrogators in an experiment that will attempt to prove that the answer is yes.

In the "Turing test" a machine seeks to fool judges into believing that it could be human. The test is performed by conducting a text-based conversation on any subject. If the computer's responses are indistinguishable from those of a human, it has passed the Turing test and can be said to be "thinking."

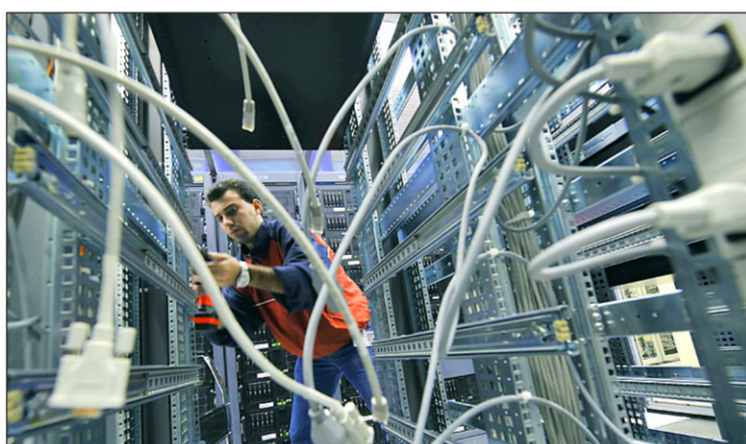
No machine has yet passed the test devised by Turing, the British genius who helped to crack German military codes during World War II. But at 9am this coming Sunday, six computer programs — "artificial conversational entities" — will answer questions posed by human volunteers at the University of Reading, England, in a bid to become the first recognized "thinking" machine. If any program succeeds, it is likely to be hailed as the most significant breakthrough in artificial intelligence since the IBM supercomputer Deep Blue beat world chess champion Garry Kasparov in 1997. It could also raise profound questions about whether a computer has the potential to be "conscious" — and if humans should have the "right" to switch it off.

Professor Kevin Warwick, a cyberneticist at the university, said: "I would say now that machines are conscious, but in a machine-like way, just as you see a bat or a rat is conscious like a bat or rat, which is different from a human. I think the reason Alan Turing set this game up was that maybe to him consciousness was not that important; it's more the appearance of it, and this test is an important aspect of appearance."

The six computer programs taking part in the test are called Alice, Brother Jerome, Elbot, Eugene Goostman, Jabberwocky and Ultra Hal. Their designers will be competing for an 18-carat gold medal and US\$100,000 offered by the Loebner Prize in Artificial Intelligence.

The test will be carried out by human "interrogators," each sitting at a computer with a split screen: one half will be operated by an unseen human, the other by a program. The interrogators will then begin separate, simultaneous text-based conversations with both of them on any subjects they choose. After five minutes they will be asked to judge which is which. If they get it wrong, or are not sure, the program will have fooled them. According to Warwick, a program needs only to make 30 percent or more of the interrogators unsure of its identity to be deemed as having passed the test, based on Turing's own criteria.

Warwick said: "You can be flippant, you can flirt, it can be on anything. I'm sure there will be philosophers who say, 'OK, it's passed the test, but it



doesn't understand what it's doing."

One such philosopher is Professor A.C. Grayling of Birkbeck College, University of London. "The test is misguided. Everyone thinks it's you pitting yourself against a computer and a human, but it's you pitting yourself against a computer and computer programmer. AI is an exciting subject, but the Turing test is pretty crude."

CAN YOU TELL HUMAN FROM MACHINE?

One of these conversations is between Professor Kevin Warwick and a human; the other between Warwick and a computer. Can you tell which is which?

CONVERSATION ONE

SUBJECT: Hello. My name is Nick and I am a human.
KEVIN WARWICK: Are you happy being a human?
SUBJECT: Yes, I am. Are you? Good. Then we are both happy.
KW: Yes, I am. Are you happy with your life at present?
SUBJECT: Parts of it. I hate my job, but most people do, right?
KW: I'm OK with mine. What is your job?
SUBJECT: I work as an "online Internet advertising monitor," which is fancy language for electronic filing. What do you do?
KW: I interrogate humans and machines.
SUBJECT: Which ones do you prefer, humans or machines?
KW: Which do you prefer?
SUBJECT: Hmm. Depends on for what purpose you mean.
KW: To go to a restaurant, for example?
SUBJECT: Then I would much prefer going with a human.

CONVERSATION TWO

SUBJECT: Hello, my name is Mike and I am a man.
KEVIN WARWICK: Are you happy being a human?
SUBJECT: Judge, I'm a guy.
KW: Does that worry you?
SUBJECT: Don't worry, we'll work everything through.
KW: Do you have worries then?
SUBJECT: Let's move on from that basis.
KW: Why?
SUBJECT: Why? I like this subject.
KW: What is the subject, do you think?
SUBJECT: What is the subject I wonder if I think? I know that it's good to think about. Think deeply about mysterious subjects.
KW: What mysterious subjects?
SUBJECT: Think deeply about mysterious subjects.
KW: What's a subject?